Montgomery County
Department of Permitting Services
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# REQUIREMENTS FOR THE SUBMITTAL OF SPRINKLER AND STANDPIPE PLANS NFPA 13, 13R, AND 14 SYSTEMS

Effective: October 1, 2014

Supersedes: October 1, 2008

## A. PERMIT PROCEDURES

1. Permits and submittals are required for all work involving any sprinkler additions or modifications.

2. Fill out Permit Application Form, in full, and include with all submissions. Remember to sign the bottom. Indicate if the system is non-required by the building and/or fire codes.

3. Include any fee due at the time of submission.

4. For revisions to approved plans, also include a copy of the original approved plans.

5. The sprinkler contractor will be called with the result of the review as follows.

    a. Approved plans will have the comments attached upon pick up by the contractor.
    b. Disapproved plans will have a rejection letter included upon pick up by the contractor.
    c. At the discretion of the reviewer, the submittal may be placed on suspension and all comments will be faxed or e-mailed. This will be done only twice (once for 20 days and once for 10 days), after which the submittal will be disapproved.

6. Some shell plans for speculative buildings have been kept in our office since 1986. If you wish to see these plans, contact a reviewer.

7. For projects within the City of Gaithersburg, contact their Fire Marshal at (301) 258-6330

8. For projects within the City of Rockville, contact their Fire Marshal at (240) 314-5000.

B. GENERAL SUBMITTAL REQUIREMENTS

1. Number of copies of plans: minimum of two; maximum of five. We will retain one set

2. Number of copies of calculations: one set; each calculated area stapled individually. Computer printed pages shall be separated prior to stapling.

3. Catalog cuts are required only for backf1ow preventer, detector check, meter, and special sprinklers and valves(pressure regulating, dry, deluge, ect.) . Submittals with residential, QR, extended coverage, and other heads with special manufacturer's instructions shall include the manufacturer's advanced installation guide with criteria for all situations on the project (such as heat danger areas, cold solder, obstructions). Residential heads without advanced installation guides will not be allowed.

4. All drawings must be folded to facilitate review and storage.

5. High rise or other phased retrofits: a copy of the agreement signed by DPS and the Fire Marshal's office must be submitted.

6. For complexes (such as garden apartments or townhouses) where typical building(s) prevail, show only the typical arrangement(s) and provide verification that the most remote building (highest and most remote from water source) is calculated.

7. Drawings must be prints with no handwritten changes or corrections (after printing). They must be folded and stapled in sets.

8. For continuations of large projects or for revisions, indicate the previous reviewer's name and the log number. If possible, include a copy of the original reviewed plans.

9. For submittals involving work on a portion of any plan (such as tenant work or partial revisions). cross off any areas not to be reviewed on each set.

C. INFORMATION REQUIRED ON DRAWINGS

1. General
    a. Project name and address (include all addresses if more than one bldg~
    b. Project owner's name and address including zip code (tenant for tenant work; building owner for shell work).
    c. Building permit number.
    d. Montgomery County or State of Maryland sprinkler contractor license number & expiration date.
    e. Contractor name, address, telephone number, & contact person.
    f. Symbol & abbreviation key.
    g. Minimum scale for floor plans is 1/8" per ft. Prefer 1/4" per ft. for residential areas.

2. Architectural

a. Occupancy of all rooms and areas labeled. Separate list key with room numbers is unacceptable.
   (1) If hazard classification is not obvious by the room name, provide further clarification.
   (2) For laboratories, provide NFPA 45 classification.
b. Location of all partitions.
c. Rating of any fire walls, partitions, and doors; in particular when using the room design method.
d. Location of all doors.
e. Ceiling construction and height
f. Ceiling obstructions (lights, bulkheads, etc.).
g. Explain blind spaces and other areas where sprinklers are not to be installed.
h. Full height cross sections; enough to show all conditions. Give elevations in terms of sea level for all floors.
i. Show parking space layout in garages with standpipe systems to enable us to check hose reach. Reach must be measured at right angles.
j. Show water curtains & 18" draft stops for floor openings.

3. Site plan

a. To scale or dimensioned.
b. Size, type, and arrangement of feed mains.
c. Test point, water supply, and low/high gradient info.
d. Sea level elevations for supply point & building.
e. If underground pipe is installed by sprinkler contractor, show depth of cover.
f. Point of compass.
g. Fire dept connection within 100' of hydrant (NFPA 13 & 14 systems).
h. Flow tests: show gauge & flow hydrants.

4. Water Supply Information

a. New Tap

Obtain WSSC Hydraulic Information Sheet (HIS), usually from general contractor or consulting engineer. Submit copy or reproduce on drawings.

c. Existing Tap without existing underground service

(1) Obtain current flow test, elevation, and date from WSSC from its Support Services Group at their Systems Maintenance Div., 14501 Sweitzer La., Laurel MD 20707.
Phone (301) 206-4258 or FAX (301) 206-4247.
(2) Adjust for low gradient obtained from WSSC at the address above or phone the Water Resources Div. at (301) 206·8650.

d. Existing underground service lines

Flow test inside the building shall be used due to unknown condition of the underground pipe. We do not need to witness this test. It must be no older than 1 year. Remember to adjust for low gradient as above.

e. Pipe Schedule Systems

Provide graph of water supply vs. system demand to verify compliance with NFPA 13, table 11.2.2.1. Show end head pressure, elevation loss, and backflow preventer loss. Correct water supply to base of riser.

f. Other supply sources & details (tanks, pumps, etc.)

5. System layout

a. Pipe sizes (typical branch line sizes acceptable).
b. Center to center dimensions or cutting lengths of pipe and distances of sprinklers to walls in all areas & rooms.
   (1) Sloped ceilings: give sloped & flat dimensions.
   (2) Above & below ceiling systems: give dimensions for both.
c. Sizes & lengths of riser nipples & drops.
d. Locations of high temperature sprinklers.
e. Pipe sizing shall be by pipe schedules or as proven by calculations.
f. Residential sprinklers:
   (1) Show and dimension danger areas near heat producing devices as per manufacturer's recommendations or as per code (most stringent)
   (2) In addition to being required in residential dwelling units, residential heads are allowed in corridors serving only dwelling units.
g. Hanger locations.
h. Valves, drains, test connections.
1. For additions or modifications to existing systems, show enough of existing system to verify pipe scheduling, feed mains, cross mains, & supply points.
j. Hydraulic reference points corresponding to calculations.
k. Fire department connection, check valve, ball drip. Inlets shall be as follows:

| System Demand (gpm) | Min.# of 21/2" inlets |
|---|---|
| up to 749 | 2 |
| 750 to 999 | 3 |
| 1000 and above | 4 |

1. Alarms.
m. Elevations of sprinklers & supply points.
n. Zoning:
   (1) By floor when required by our Exec. Regulations.
   (2) Coordinate with fire alarm & smoke control zones. Atriums will usually require independent zones.
   (3) 2 story floor openings not classified as atriums: sprinklers at the top must be zoned with the lower level if enclosed on the upper level; otherwise sprinklers must be zoned with the upper level.
o. Sprinkler control valves (except elevator control valves) must be in stairs, valve rooms, or pump rooms for any building except schools.
p. Multiple Fire Department Connections on the same bldg. must be interconnected.
q. Protection below exterior canopies with vehicle access below: Sprinklers are not required under noncombustible or limited-combustible exterior canopies over drive-up windows. Any other type of canopy with vehicle access below must have protection beneath.

6. Riser diagram
    a. Sizes.
    b. Make & model of alarm dry pipe, or preaction valves.
    c. Fire dept connection.
    d. Backflow preventer, detector check, and/or meter if required.
    e. Air supervision for dry sprinkler systems or manual standpipe systems.

7. Calculation Design Areas
    a. Show clearly the boundary of each area. It shall comprise the actual floor area covered inside walls and halfway between sprinkler heads.
    b. Room design method or irregular areas not meeting the $1.2\sqrt{A}$ requirement show rating of walls and doors to conform to NFPA 13.
    c. Label calculation areas & coordinate with calculation cover sheets
8. Notes
    a. Number of heads on each sheet must be shown in legend.
    b. Sprinkler symbols with SIN #, make, model, orifice, temperature rating. If any special sprinklers are used (residential, QR., extended coverage, etc.), submit catalog cuts.
    c. Capacity in gallons of each dry pipe system.
    d. Pipe type. If it varies, give type for each size.
    e. Fittings, welds, bends.
    f. System design criteria (for each zone)
        (1) If existing pipe schedule: hazard.
        (2) If calculated: Hazard, density, design area, hose allowance, safety factor.
        (3) If high piled or high rack, give design analysis referencing figures, curves, and area/density modifications.
    g. Calculated systems: give the following notes for each design area:
        (1) System· demand note for each zone (flow & pressure required at a common reference point).
        (2) Give maximum sprinkler spacing as proved by calculations. If spacing varies, note must say this and we will be unable to allow field spacing changes ..
        (3) Give calculated pipe sizing as proved by calcs (number of heads on each size pipe). If sizing varies, note must say this and we will be unable to allow field sizing changes.
    h. If plastic pipe is used:
        (1) Give hanger intervals per manufacturer.
        (2) Show detail of method of restraint at sprinkler to counteract water force.

9. Standpipe systems (if provided)
    a. Class I only. Class II & III systems prohibited.
    b. Riser & hose valve locations.
    c. Riser detail.
    d. Meet required hose reach and show all doors to verify. Measure hose reach at right angles and start at the elevation of the hose outlet.
    e. Show gauges at the top of each riser.
    f. Show the hose valve height off the floor.
    g. Show reducers, caps, & chains.

Garage hose valves shall be located behind parking spaces unless reachable via a 44" curbed walkway.

h. Garage Hose Valves shall not be obstructed by parking. They shall not be located behind columns or parking spaces unless reachable via a 44" curbed walkway.
i. Garage hose valves outside stairs shall be labeled with signs or a red stripe around the columns.
j. Hose valves outside stairs cannot substitute for those required inside stairs.

10. Fire Pump Details (if provided)
    a. Capacity (flow & pressure), make, model, listing.
    b. Cross section.
    c. Bypass.
    d. Location of jockey pump and all controllers.
    e. Relief valve when allowed by NFPA 20. Pipe to drain or outside.
    f. Addition or retrofit of any new sprinkler systems will necessitate the upgrading of existing pump installations to meet NFPA 13, 14, & 20.
    g. The eccentric suction reducer shall be mounted with flat side on bottom if fed directly by an elbow from above.
    h. Show the high hydraulic gradient {from the appropriate water authority).

11. High Rack & High Piled Storage
    a. Storage height and arrangement including aisle widths.
    b. Commodity classification.
    c. Hand hose outlets. Hose is prohibited for new & existing buildings.
    d. Multiple level storage with open grated flooring: walkways must be designed for the entire storage height.

12. Speculative Spaces (subject to tenant changes regardless of lease term)
    a. New speculative spaces shall be designed per our Executive Regulations for adequate system flexibility (worst case potential usage, height, aisles, commodity, etc.).
    b. Consider all NFPA codes with sprinkler criteria.
    c. If project covers common areas, but not tenant areas, provide phantom calculations to establish sizing & spacing for future tenant work. Shell approval must include protection for all non-leasable areas including means of egress.
    d. Room design method & small room exception (head omission in calcs) will not be permitted due to potential for future wall demolition.
    e. Piping layout must be a tree or looped system; grids not allowed.
    f. Sprinklers: Types must not be mixed (such as EC & SSP). If possible, use solely 1/2" or 17/32" standard spray sprinklers in office & ord. gr. 2 retail occupancies.
    g. Include elevation loss in calcs to roof deck for future tenants without ceilings.
    h. If using QR area reduction, use full height to roof deck for future tenants without ceilings.
    i. Minimum 1" outlets shall be provided.
    j. High piled or high rack designs: show hose valve supply point for shell calcs, even if valves will be added during later tenant work.

13. Tenant Plans

a. Tenant location highlighted & other tenants crossed off
b. All notes on attached list
c. If original system design criteria is not available, recalculate.
d. Original criteria must be adhered to on any given floor. Criteria may only be changed on an "entire floor" basis.
e. Arm-over and tie-in details.
f. If standpipes provided: show hose valves, doors, and verify compliance with hose reach limit corresponding to the edition of NFPA 14 that the system met when designed. If unable to meet reach requirements with valves in stairs or public corridors, place valves as close to corridors as possible.
g. Show enough of adjacent area to enable verification of pipe sizing.
h. Change to a lesser hazard must use the same pipe sizing as shell calculations; spacing may be increased by density conversion. Example: Orig. head flow 20.0 gpm for 100 SF spacing at ordinary group 2 density of 0.20. New spacing for light hazard will be 20.0 gpm/ 0.10 density = 200 SF.
1. Change to a higher hazard must be recalculated except rooms with 6 or less heads. These small rooms may use the same pipe sizing with a decrease in head spacing by density conversion. Example: Orig. head flow 16.8 gpm for 168 SF spacing at light hazard density of 0.10. New spacing for small mechanical room (ord. gr. 1) will be 16.8 gpm/0.15 density = 112 SF.
j. Newly plugged outlets must be considered heads for the purpose of pipe sizing.
k. Pipe Schedule systems: give head counts for entire floor up to unlimited pipe size.

D. INFORMATION REQUIRED ON CALCULATIONS

1. General

a. Date.
b. Project name and address.
c. Calculation identification number and floor must be shown on cover sheet and coordinated with plans.
d. Contractor name, address, phone number, and contact person.
e. Provide fixture load analysis for 13R systems.

2. Design Criteria

a. Hazard classification.
b. Design area.
c. Design density.
d. Inside and outside hose allowances.
e. Area per sprinkler as calculated.
f. Water supply and pump information.
g. Any general storage, supply, shipping, receiving, loading or other storage areas, regardless of room name, are classified as ordinary group 2 unless special usage allow ordinary group 1 per table for Miscellaneous Storage.
h. Multi-purpose rooms in schools and other assembly occupancies are considered ordinary group 1. If there is no multi-purpose room in a school, the gym shall be designed as ordinary group 1.

i. "Space-saver" storage/files that close against one another are classified as extra hazard group 2.
j. Laboratory sprinkler systems, including those in Health Care occupancies, must be designed in accordance with the hazard classifications in NFPA 45.
k. Consider sprinkler criteria in other NFPA standards such as 30 (flammable liquids), 30B (aerosols), 430 (oxidizers), and the 13 (storage)

3. Calculations
   a. NFPA 13 Format
   b. Sprinkler K Factor(s)
   c. Hydraulic Reference points.
   d. Pipe Sizes & lengths.
   e. Fitting & devices shall be included & labeled.
   f. Friction loss factors.
   g. Total friction loss between reference points.
   h. Pressure at each reference point.
   i. Velocity & normal pressures if used.
   j. Submit as many calcs as necessary to prove all conditions including largest spacing, most demanding, sizing, longest branch lines, etc.
   k. Insert inside hose allowance at the nearest hose valve and outside hose allowance at the nearest hydrant.
   l. Carry calculations to:
      (1) the point of connection when using HIS.
      (2) the gauge hydrant when using an outside flow test.
      (3) the gauge location when using an interior flow test.
   m. Include water curtain demand for floor openings in the nearest calculation on the same floor.
   n. Include drops and arm-overs in calculations.

4. Other
   a. Summary graph sheet showing adjusted water supply, pumps, hose allowance, and demand point(s).
   b. Gridded system (owner occupied only) calculations must include:
      (1) sketch including reference points, flows, and flow directions.
      (2) proof of peaking.
   c. On systems utilizing fire pumps, supply and demands must be corrected to the location of the pump to verify adequate suction pressure at 150% of capacity.
   d. Standpipe systems: include both pump & FDC calculations unless the fire pump is sized for the full system demand.
   e. Standpipe calcs may use multiple FDC's only if all FDC's meet the position & location requirements.
   f. If pumps and/or tanks are used in areas with public water supply: Submit calcs to prove that system cannot be designed to work with public water. All design variations including head spacing, orifice size, pipe sizing, looping, and gridding(owner occupied only) must be ruled out to allow pumps and/or tanks.

NOTES TO BE SHOWN ON TENANT SPRINKLER DRAWINGS

Original hazard occupancy per calc: _____ calc area _____ density ____ safety factor __

Original calculated pipe sizing: __ sprinklers on __ pipe
__ sprinklers on __ pipe
__ sprinklers on __ pipe
armover length ____
arm-over size _____

Original calculated sprinkler head spacing: _____ SF max.

Original pipe type: _____original fitting type: _____

Original sprinkler information (SIN#, symbol, make, model, orifice, temp):

New pipe type: _____new fitting type: _____

New sprinkler information (symbol, make, model, orifice, temp): _____

Number of new sprinklers ____ relocated sprinklers (off original outlets} __

Density conversion to higher hazard: (___ SF orig. flow)/(____ new density)= ____ new spacing to be used in all rooms of _____ hazard, group _____, with 6 or less heads.

Density conversion to lower hazard: (___ SF orig. flow)/(____ new density)= ____ new spacing to be used in all rooms of _____ hazard, group _____.

All rooms are _____occupancy unless noted otherwise (indicate room name, not hazard class).

Ceiling height is _____ unless noted otherwise.

Laboratories are class __ per NFP A 45 according to owner rep _____ _

Hangers to be installed as req'd by NFPA 13; See detail # _____ for types of hangers.

Tenant owner's current full address: _____

Building permit number: _____ _

Sprinkler license number: _____expiration date _____

See detail # _____ for tie-in/armover information.

Standpipe code (check one): Before 4/11/95 (100' hose with 30' stream) __
After 4111/95 (150' hose) ____
if sprinklered (200' hose)_____

Number of new fire hose valves provided: _____(shall be 5' AFF and have reducers/caps/chains.)

Hydrotest pressure shall be _____ due to high gradient and pump churn.